SOLAR CORONAE: FIVE YEARS' RECENT OBSERVATIONS.[2]

551.590.2(048)

By J. MAURER.

[*Abstract of paper* presented to Swiss Society of Geophysics, etc., Zurich, Sept. 11, 1917.]

Simple examination of the sky during the day almost always shows us the sun surrounded by a circular whitish luminosity whose diameter and intensity is subject to great variations. Disregarding all theoretical considerations concerning this phenomenon, it may be stated that it has not received systematic attention until quite recently, and strictly speaking only since the great atmospheric-optical disturbance of 1912. The writer has been able to interest Dr. Friederich Schmidt, our distinguished observer of the zodiacal light, and also Prof. Dorno, of Davos, who has already published quite a series of observations.[3]

Searching and continuous study of the solar nimbus shows that one often has to do with a true corona and that it is the simplest and surest criterion of the degree of purity of our atmosphere.

The first result of our observations since 1912–13 was the great solar nimbus showing two distinct minima in its diameter annually, viz, at April–May and at August–September 1; the nimbus may completely disappear at those epochs. The year 1916 has shown a quite different course from spring to fall. The spring minimum has been very slightly marked and as early as April the solar corona attained a diameter of 100°. Then in July and in August, 1916, even in the blue sky, the nimbus often assumed enormous dimensions and approached 140° toward the middle and end of August, 1916. These were the forerunners of an atmospheric-optical disturbance which other signs had revealed as early as the beginning of April.

The solar nimbus presents very remarkable phases at the epochs of great solar activity; when its diameter is 70° to 80° or even 100°, it is surrounded by a broad border distinctly colored by a tint between red and yellow-brown. The nimbus then gives absolutely the impression of a Bishop's Ring, having a notably large diameter. The intense developments of this border are accompanied, without exception, by notable telluric and atmospheric phenomena (polar auroræ, earth currents). Without doubt we then (notably June 16, 21–23, 1916, and February 11, 1917) have to do with extensive emission of cathode rays by the sun, according to Birkeland's views. The rapid appearances and disappearances of the colored ring are incompatible with the idea of an intermittent corona (auréole) due to clouds of discrete volcanic ash.

To explain the solar nimbus by the theory of diffraction requires the existence of very small particles very close together in the atmosphere; these particles would be produced by the nuclei of condensation sent to the earth by the sun during its paroxysms and which also call forth the polar auroræ.

According to Dorno there was, at Davos, an intimate and regular relation between the solar activity and the occurrence and intensity of the great solar corona. Does this relation always obtain? Prolonged observations at very diverse localities at considerable altitudes, will decide this.

[2] *J. Maurer* (Zurich). Couronnes solaires. Résultats de cinq années d'observations récentes. Arch. des sci. phys. et nat., Genève, 15 Nov. 1917, 44: 349–350.

[3] See Astronomische Nachrichten, No. 4899, Aug. 1917, 205; translated in this REVIEW October, 1917, 45: 483–484. *Also*, Veröffentl. d. königl. Preuss. meteorolog. Instit., No. 295, Berlin, 1917.

NEED OF GEOPHYSICAL OBSERVING STATIONS.[5]

By P. GRUNER.

[*Abstract of* a paper presented to Swiss Society of Geophysics, etc., Zurich, Sept. 11, 1917.]

The speaker pointed out the fine recent development in the study of phenomena in atmospheric optics and electricity. Such observations of a geo- and aërophysical nature may not be asked of existing meteorological stations which are already overloaded; we need special observational posts located at favorable points (free from dust and smoke, having extended horizon) distributed throughout Switzerland *at widely differing altitudes*, and served by well-trained personnel. Concomitant observations carefully made and at diverse stations are essential for the solution of the interesting problems in atmospheric electricity, in polarization and the intensity of the skylight, of twilight (particularly the purple light) as well as their relations to meteorological, atmospheric, and astrophysical conditions.

Beside three or four principal stations after the model of the one at Davos conducted by Dr. Dorno, there should be established a series of other temporary stations (for about a semester) where young investigators could work and which would require but a small amount of material. Further, one should pay for the services of local observers here and there, in order that they devote the necessary time to such researches.

A fund for scientific research, administered by the Société Helvétique des Sciences Naturelles, would render splendid service along this line

[5] *P. Gruner*. De la nécessité d'ériger des stations d'observations géophysiques. Arch. des sci. phys. et nat., Genève, 15. Nov. 1917, 44: 366.